

REMARKS

Reconsideration of the application is respectfully requested for the following reasons:

1. Rejection of Claims 1, 2, 5, 6, and 9-10 Under 35 USC §103(a) in view of U.S. Patent Nos. 5,959,382 (Dauwalter) and 4,868,443 (Rossi)

This rejection is respectfully traversed on the grounds that the Dauwalter and Rossi patents, whether considered individually or in any reasonable combination, fail to disclose or suggest using a flat metal part of an apparatus to be driven as the rotor of an induction motor system, much less using slots in the wheel to indicate the position of the rotor. Instead, as explained in previous responses, the slots between the teeth in the rotor of Dauwalter assist in positioning of the motor, but are not used to detect the position of the motor, while the alleged “slots” of Rossi are actually spaces between stator coils, rather than parts of a rotor.

It appears that the Rossi patent has been mis-interpreted as teaching use of the spokes of a driven part to detect rotor position. The rotor of Rossi is not an induction rotor made up of flat metal part with spokes, as claimed, but to the contrary is simply a permanent magnet rotor having an annular shape, as depicted in Fig. 4. The stator, on the other hand, is made up of a plurality of overlapping coils. While this might form a structure that appears to have spokes with slots therebetween, as depicted in Fig. 2 of the Rossi patent, it does not resemble the claimed invention, which differs in at least the following respects:

- The claimed invention is a rotor in the form of a flat metal part having slots extending therethrough, whereas the rotor of Rossi consists of permanent magnets in an annular configuration (and the rotor of Dauwalter is in the form of toothed wheel);
- The claimed invention detects the position of the slots in order to determine the position of the motor, whereas Rossi detects motor position based on the magnetization lines in the magnet rotor, the trapezoidal geometry of the stator

coils (which results in the so-called “spokes”), and a cam disc attached to the rotor (and Dauwalter does not disclose any specific rotor position detection, much less detection of slot positions).

Thus, Rossi does not disclose any features of the claimed invention, and clearly does not suggest modification of the rotor of Dauwalter to include the claimed slots, or use of those slots for position detection.

To the contrary, position detection in the motor of Rossi is accomplished with the assistance of a cam disc (22) rotating in synchronism with the magnet rotor. In a rather complex arrangement described in col. 9, line 5 to col. 10, line 14, the cam disc (22) of Rossi provides a “screening effect” that enables the exact position of the rotor to be determined so as to permit proper selection and timing of coil excitation. This is clearly not analogous to the claimed position detection by slot detection. **Rossi cannot possibly suggest use of slots in a rotor for position detection since Rossi’s rotor does not include slots, and position detection is based on the geometry of the stator coils, annular permanent magnet rotor, and a “cam disc” attached to the rotor, and not on a particular structural feature of the rotor.**

It is noted that the Examiner’s response to Applicant’s arguments was based at least in part on the alleged lack of a recitation that the slots extend through the rotor, even though claim 14 specifically recited that the slots extend completely through the rotor. In reply, the Applicant respectfully submits that the Dauwalter and Rossi patent do not disclose or suggest detection of the position of any kind of slots extending into the rotor, whether they extend partially or completely through the rotor. **In fact, the rotor of Dauwalter cannot be modified to include slots through the rotor since Dauwalter requires “*a back iron area behind the teeth and slots to complete the flux path within the excited member*” (see, e.g., lines 5-7 of the Abstract of Dauwalter).** This back iron is critical to operation of the actuator of Dauwalter, with the objective of Dauwalter being to reduce the back iron thickness to a minimum without eliminating it. The rotor of the present invention, on the other hand, requires no such back iron and, in the embodiment of claim 14, precludes such a back iron

by extending the slots through the rotor. Since the back iron of Dauwalter is “behind the teeth and slots,” it cannot be eliminated to form slots.

In addition, the Examiner has argued that if the prior art structures are capable of performing recited functions, then recitations of the functions are met unless there is a “structural difference.” In reply, the Applicant respectfully submits that:

- a. Neither the Dauwalter patent nor the Rossi patent discloses a rotor capable of the claimed functions or “intended uses.” The rotors of Dauwalter and Rossi both fail to include any slots that might serve as position detectors for use in controlling the motor, and therefore neither is capable of performing the recited functions, and both exhibit structures that are different from the claimed rotor; and
- b. The function of controlling driving of the rotor is recited as a “means” and therefore is a positive recitation pursuant to 35 USC §112, 6th Paragraph. It is well-established that if the function of a means recitation is not met by the prior art, then the means recitation is not met.

Finally, in response to the Examiner’s comments on attacking references individually, the Applicant respectfully notes that the “attacks” on Dauwalter and Rossi are intended to show why the references cannot be *combined* to obtain the claimed invention. One reason that they cannot be combined to obtain the claimed invention is that neither patent suggests one of the features of the claimed invention, namely rotor position detection and control by detecting the slots extending into the rotor. Another reason is that modification of the rotor of Dauwalter by extending the slots through the rotor, as recited in claim 14, would be impossible since the rotor would in that case simply be cut into pieces, and would clearly contradict one of the objectives of the structure of Dauwalter, which is to maintain and reduce the “magnetic path thickness” (instead, any slots on the surface of the rotor of Dauwalter must be concentric about the spin axis, as is apparent from Fig. 6 of the Dauwalter patent, so that the rotor of Dauwalter can rotate around the M_x and M_y axes).

It is true that individual elements of the claimed *combination* are arguably known. In fact, virtually all patented inventions are made up of known elements. However, none of the references that disclose individual elements of the combination, *i.e.*, elements of flat disc induction motors, even remotely suggests that the rotor may be part of an apparatus, such as the wheel assembly of a vehicle, and it is certainly not taught by either Dauwalter or Rossi.

Because none of the references cited in the application to date, *whether considered individually or in any reasonable combination*, discloses or suggests use of a driven part of an apparatus, such as a wheel, as an induction motor rotor in order to eliminate the need for differentials, torque converters, drive chains, and/or other parts of the drive train of a conventional vehicle, or the claimed slots which serve to enable smooth operation of the motor by providing a reference, and which further reduce the weight of the motor and enhance its appearance, withdrawal of the rejection of claims 1, 2, 5, 6, and 9-10 under 35 USC §103(a) is again respectfully requested.

2. Rejection of Claims 3, 4, 7, 8, 11, and 12 Under 35 USC §103(a) in view of U.S. Patent Nos. 5,959,382 (Dauwalter), 4,868,443 (Rossi), and 6,283,255 (Gardner)

This rejection is respectfully traversed on the grounds that the Gardner patent, like the Dauwalter and Rossi patents, fails to disclose or suggest using a driven part of an apparatus, such as the spoked wheel of a vehicle, as the rotor of an induction motor system, much less using slots in the wheel to indicate the position of the rotor during driving.

Instead, the Gardner patent discloses a caliper assembly for a motorcycle in which the caliper frictionally engages a brake disk. There is absolutely no suggestion of using the brake disk as a rotor of an electro-magnetic device, and it makes no sense to use a friction brake rotor for that purpose. It also makes no sense to use a magnetically suspended stepper motor rotor of the type taught by Dauwalter in the friction brake assembly of Gardner.

In the claimed invention, the function of braking is achieved via the electromagnetic force that is generated by regeneration of the motor. There is no frictional force involved with the braking function, and no need for brake shoes and pads of the type used by Gardner. Accordingly, even if the proposed combination of Gardner and Dauwalter were proper, the claimed invention would not have resulted, and withdrawal of the rejection of claims 3, 4, 7, 8, 11, and 12 under 35 USC §103(a) is respectfully requested..

3. Rejection of Claims 13-15 Under 35 USC §103(a) in view of U.S. Patent Nos. 5,959,382 (Dauwalter), 4,868,443 (Rossi), and 6,283,255 (Gardner) and Brembo High Performance FAQ's (Brembo)

This rejection is respectfully traversed on the grounds that the Brembo publication, like the Dauwalter, Rossi, and Gardner patents, fails to disclose or suggest disclose or suggest using a driven part of an apparatus, such as the spoked wheel of a vehicle, as the rotor of an induction motor system, much less using slots in the wheel to indicate the position of the rotor during driving.

While Brembo discloses slotted brake disks, the slots are not used for motor position determination and driving control, as positively recited in each of the independent claims, and are not part of the rotor of an induction motor.

Furthermore, the Dauwalter rotor requires a “back iron” that is “behind the teeth and slots” (see the Abstract) while Rossi requires an cam disc attached to the rotor, both of which preclude position-detection slots, and in particular position-detection slots that extend completely *through* the rotor as recited in dependent claims 13-15.

As a result of these differences, withdrawal of the rejection of claims 13-15 under 35 USC §103(a) is respectfully requested.

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Having thus overcome each of the rejections made in the Official Action, withdrawal of the rejections and expedited passage of the application to issue is requested.

Respectfully submitted,

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